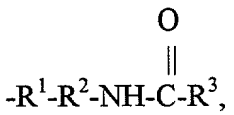
WHAT IS CLAIMED IS:

1. A vascular graft having at least one hydrophobic surface, said surface having a bio-active coating bound thereto, said bio-active coating containing a polymer backbone bound via an amide or an amine linkage to a first end of a hydrophilic, amine –terminated spacer, said spacer having at least one amine group at each of its first and second ends, said hydrophilic spacer being covalently bound to a bio-active molecule via its second end, said hydrophilic spacer further being repelled by said hydrophobic surface such that the bio-active molecule is extended away from said hydrophobic surface, wherein said bio-active coating comprises a polymer structure defined by a bio-compatible polymeric backbone and at least one pendant moiety selected from the group consisting of:



$$-R^1-R^2-NH-\overset{\overset{O}{\|}}{C}-R^3,$$

wherein R^1 is  or –N-; R^2 is a spacer group selected from the group consisting of oxygenated polyolefins, aliphatic polyesters, polyamino acids, polyamines, hydrophilic polysiloxanes, hydrophilic polysilazanes, hydrophilic acrylates, hydrophilic methacrylates, linear polysaccharides and lightly branched polysaccharides; and R^3 is a bio-active agent selected from the group consisting of antithrombogenic agents, antibiotics, antibacterial agents, antiviral agents, pharmaceutical salts thereof and mixtures thereof.

2. The vascular graft of claim 1 wherein said vascular graft is made from a synthetic polymer material selected from the group consisting of ePTFE, PTFE, polyurethane and polyethylene terepthalate.

3. A medical device with at least one hydrophobic surface having a bio-active coating thereon, said bio-active coating being the reaction product of:

   a) a first reaction comprising reacting in the presence of a first dehydrating agent, a bio-compatible polymer backbone containing one or more carboxylic acid groups with a

hydrophilic, amine-terminated spacer having at least one amine group at each of its first and second ends, wherein one of said amine groups reacts with one or more of said carboxylic acid groups in said polymer backbone to form an amide bond between said spacer and said polymer backbone; and

b) a second reaction comprising reacting a bio-active agent with a remaining unreacted amine terminated end of said spacer in the presence of a second dehydrating agent to covalently bind said bio-active agent to said spacer.

4. The device of claim 3 wherein said polymer backbone is selected from a group consisting of siloxane-urethane copolymers, polyurethane, and polyurethaneura.

5. The device of claim 3 wherein said spacer is selected from a group consisting of oxygenated polyolefins, aliphatic polyesters, polyamino acids, polyamines, hydrophilic polysiloxanes, hydrophilic polysilazanes, hydrophilic acrylates, hydrophilic methacrylates, linear polysaccharides and lightly branched polysaccharides.

6. The device of claim 3 wherein said bio-active agent is selected from a group consisting of antithrombogenic agents, antibiotics, antibacterial agents, antiviral agents, pharmaceutical salts thereof and mixtures thereof.

7. The device of claim 3 wherein said bio-active agent is selected from a group consisting of heparin, prostaglandins, urokinase, streptokinase, sulfated polysaccharide, albumin, pharmaceutical salts thereof and mixtures thereof.

8. A medical device having a bio-active coating over a body fluid contacting surface of said medical device for contacting body fluids, wherein said body fluid contacting surface is covalently bonded to said bio-active coating, said coating comprising a polymeric structure, said polymeric structure defined by a bio-compatible polymeric backbone containing a carboxylic acid group

which forms an amide linkage with said at least one pendant moiety, said pendant moiety having the formula:

$$-R^1-R^2-NH-\overset{\overset{O}{\|}}{C}-R^3,$$

wherein R^1 is $-\overset{\overset{O}{\|}}{C}-\overset{\overset{H}{|}}{N}-$ or $-\overset{\overset{H}{|}}{N}-$; R^2 is a spacer group selected from the group consisting of oxygenated polyolefins, aliphatic polyesters, polyamino acids, polyamines, hydrophilic polysiloxanes, hydrophilic polysilazanes, hydrophilic acrylates, hydrophilic methacrylates, linear and lightly branched polysaccharides; and R^3 is a bio-active agent selected from the group consisting of antithrombogenic agents, antibiotics, antibacterial agents, antiviral agents and mixtures thereof.

9. A surface-modified implantable sheet material whose treated surface when exposed to a body fluid is bioactive over extended periods of time comprising:

a hydrophobic substrate material having a plasma induced hydrophilic functionality and a bio-active coating covalently bonded to said substrate material wherein the bio-active coating has a polymeric structure defined by a bio-compatible polymeric backbone containing a carboxylic acid group covalently bonded through an amide linkage to at least one pendant moiety of the formula:

$$-R^1-R^2-NH-\overset{\overset{O}{\|}}{C}-R^3,$$

wherein R^1 is $-\overset{\overset{O}{\|}}{C}-\overset{\overset{H}{|}}{N}-$ or $-\overset{\overset{H}{|}}{N}-$; R^2 is a spacer group selected from the group consisting of oxygenated polyolefins, aliphatic polyesters, polyamino acids, polyamines, hydrophilic polysiloxanes, hydrophilic polysilazanes, hydrophilic acrylates, hydrophilic methacrylates, linear and lightly branched polysaccharides; and R^3 is a bio-active agent selected from the group consisting of antithrombogenic agents, antibiotics, antibacterial agents, antiviral agents and mixtures thereof.